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Cyclones and Anticyclones Density Climatologies

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Introduction

This document shows the cyclones and anticyclones density climatologies from 1980 to 1999 in the Southern Hemisphere. Summer corresponds to December-January-February, autumn to March-April-May, winter to June-July-August and spring to September-October-November.

The Melbourne University automatic tracking scheme (Murray and Simmonds, 1991) was used to calculate the cyclone and anticyclone trajectories and system density (SD). The SD is defined as the number of cyclones/anticyclones in a reference area of 10^3 (deg. lat)^2.

A cyclone (anticyclone) is deemed to exist at any point at which the pressure is lower (higher) than at any of a small number of grid points (4 or 8) surrounding. In the second stage of the scheme the path of each system is tracked from the time of its appearance to its dissipation. To make the appropriate decisions, the procedure estimates the new position of each system, calculates the probability of associations between the predicted and realized positions, and finds the matching of these associations with the highest overall probability (Murray and Simmonds 1991).

The sea level pressure used in the tracking scheme was obtained from the NCEP reanalysis (Kanamitsu et al., 2002). All systems with lifetime higher or equal to 24 hours were detected. No additional pressure threshold was used.

Acknowledges

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References:

Kanamitsu, M.; W. Ebisuzaki; J. Woollen; S. –K. Yang; J. J. Hnilo; M. Fiorino; G. L. Potter, 2002: NCEP-DOE AMIP-II Reanalysis (R-2). *Bull. Am. Met. Soc***.**, **83**, 1631-1643.

Murray, R. J., and I. Simmonds, 1991: A numerical scheme for tracking cyclone centres from digital data. Part I: Development and operation of the scheme. *Aust. Meteorol. Mag*., **39**, 155-166.

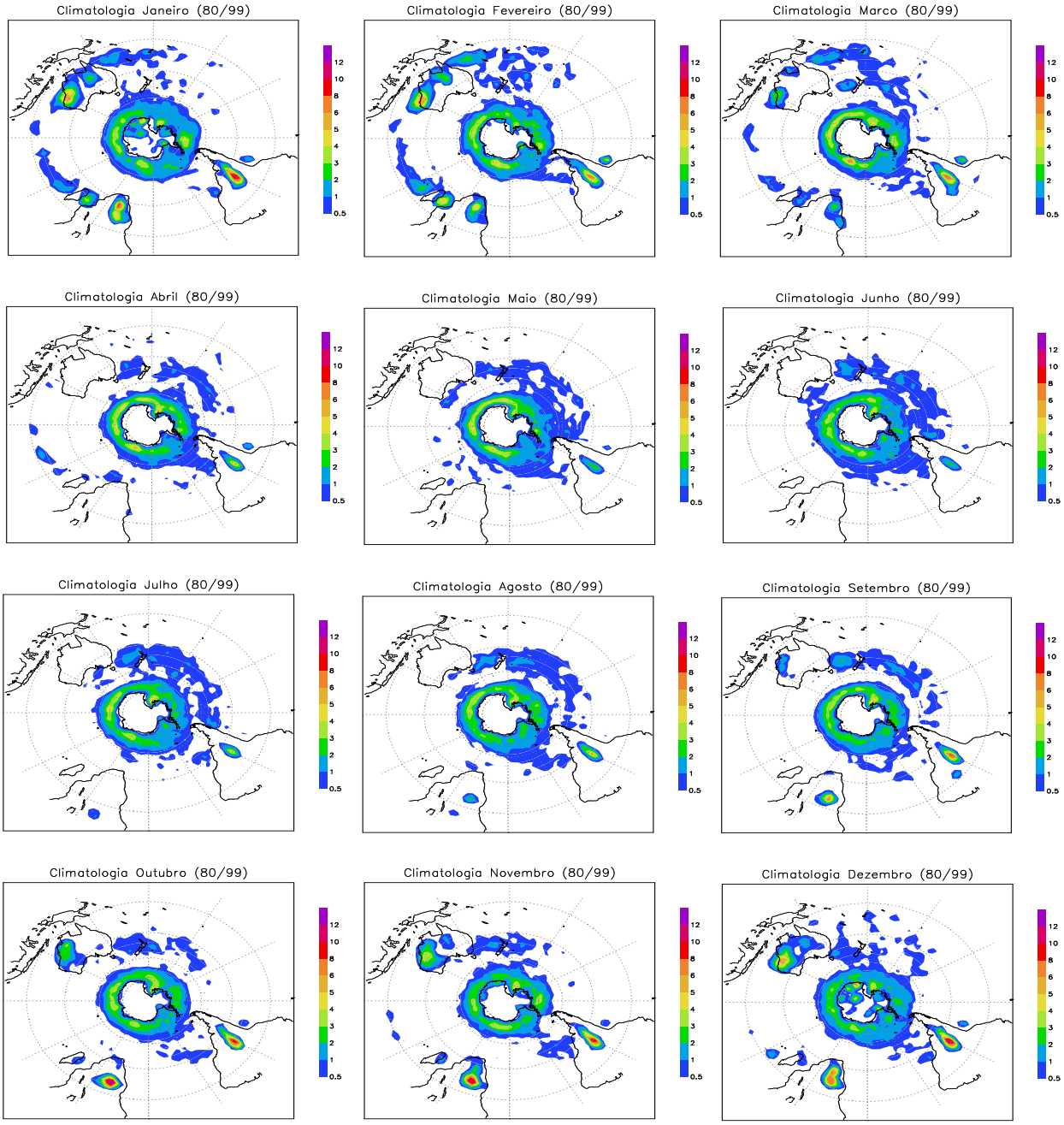

Figure 1. Monthly Climatology (1980-1999) of cyclone SD.

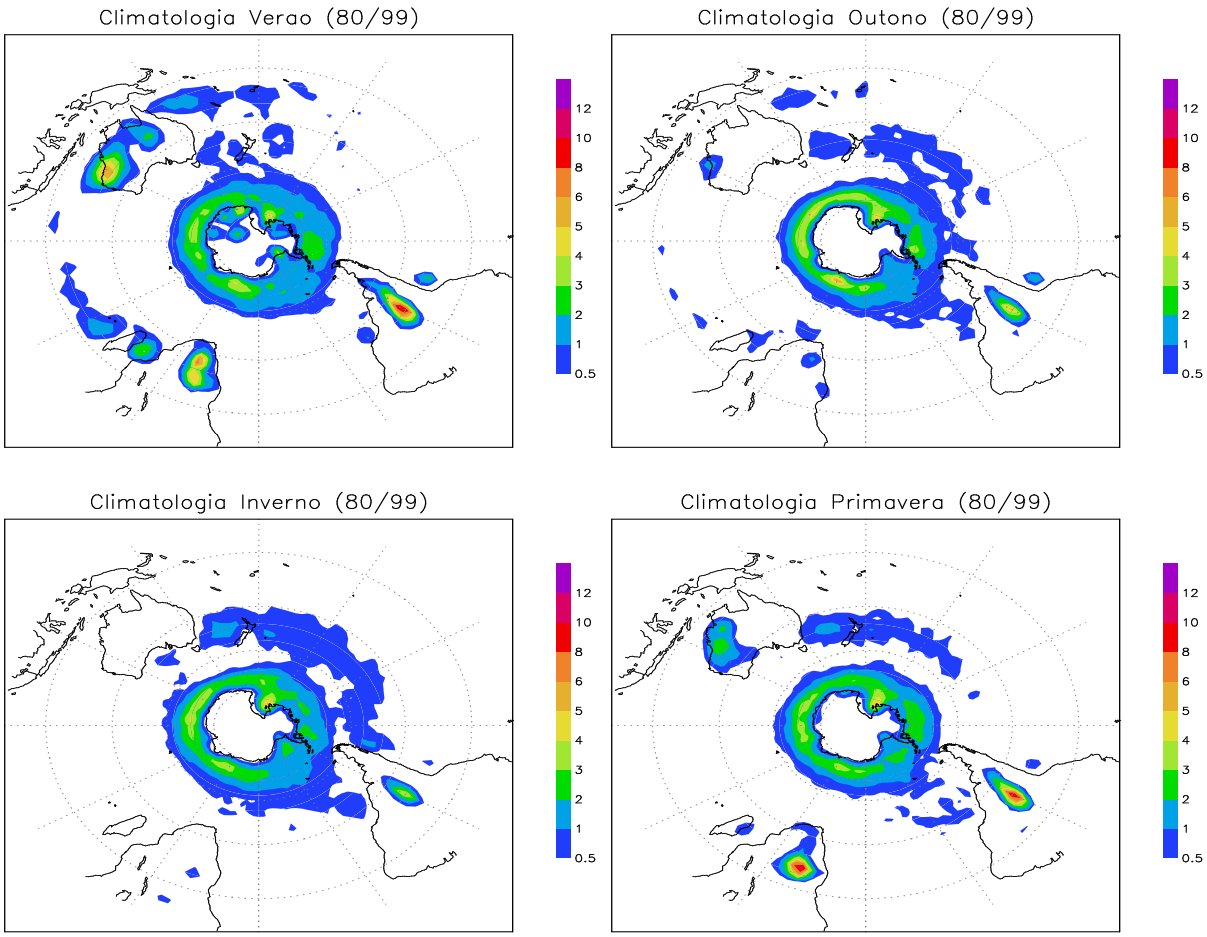

Figure 2. Seasonal Climatology (1980-1999) of cyclone SD.

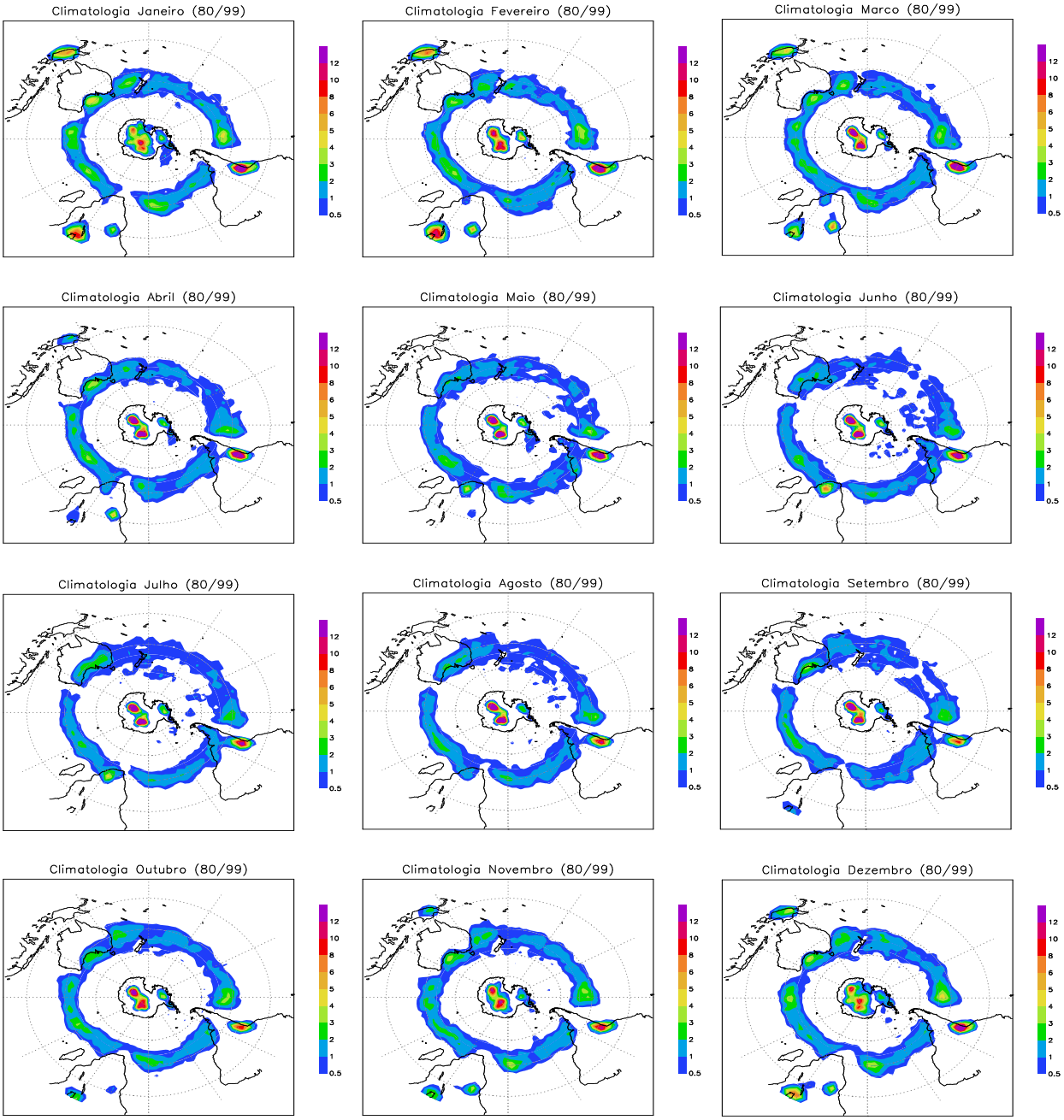

Figure 3. Monthly Climatology (1980-1999) of anticyclone SD.

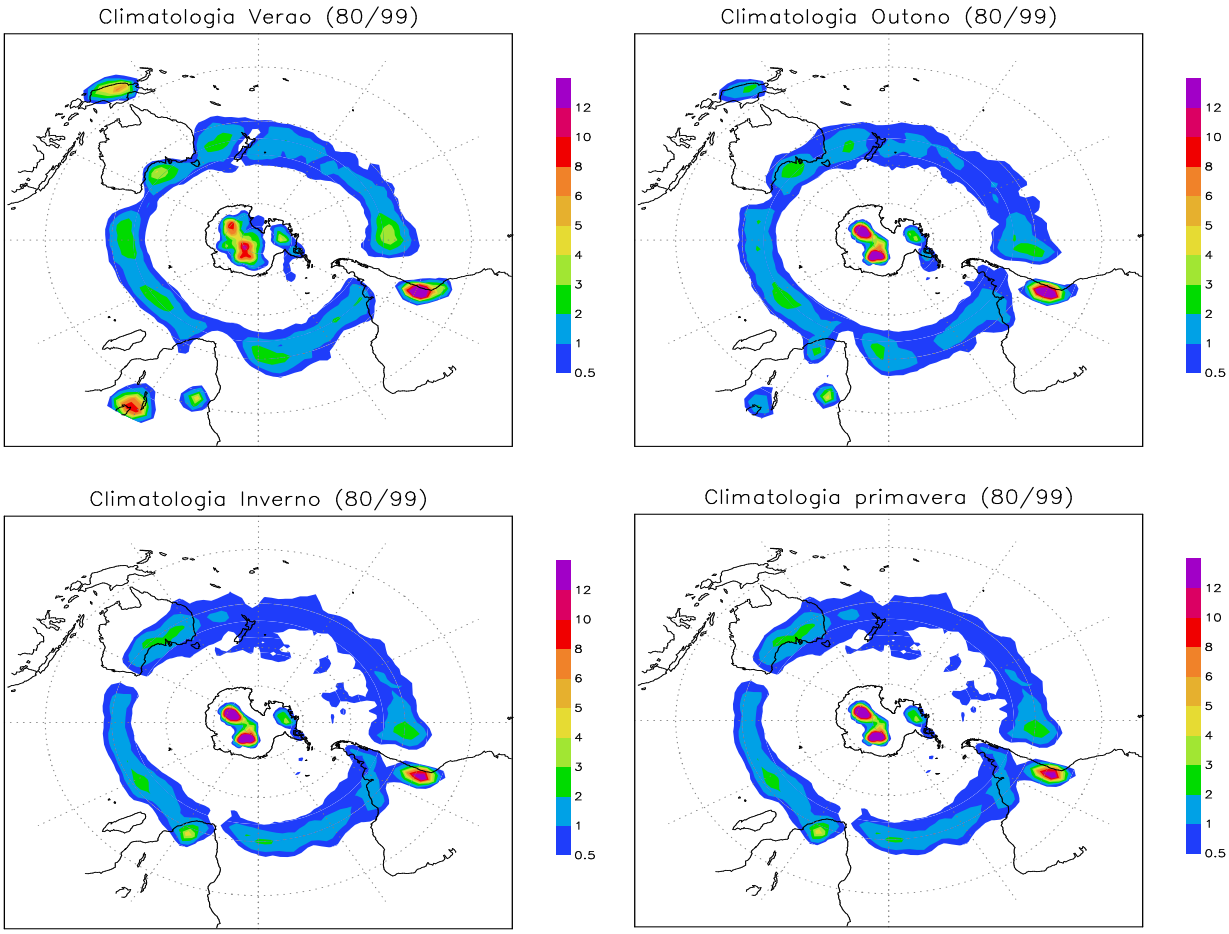

Figure 4. Seasonal Climatology (1980-1999) of anticyclone SD.